

**REMARKS**

The present response is to the Office Action mailed in the above-referenced case on July 30, 2003. Claims 1-21, 24, 26, 27 and 29-32 are standing for examination. The Examiner has objected to claim 24 due to informalities, and has rejected claims 10 and 21 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement, stating that claims 1 and 27 are also similarly not enabled. Claims 1-21, 23-24, 26-27 and 29-32 are rejected under 35 U.S.C. 112, second paragraph as being indefinite. Claims 15-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Takahashi (U.S. 6,240,075), hereinafter Takahashi. Claims 10, 12-14, 21, 23-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman (U.S. 5,898,687), hereinafter Harriman, in view of Takahashi. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman over Chao (U.S. 5,724,351), hereinafter Chao. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harriman over Takahashi, and further in view of Teraslinna (4,991,171), hereinafter Teraslinna. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holden (6,396,809), hereinafter Holden over Takahashi. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holden over Takahashi, and further in view of Harriman.

Applicant has carefully reviewed the prior art references cited and applied by the Examiner, and the Examiner's rejections, objections and statements in the instant Office Action. In response to the Examiner's rejections of applicant claims due to informalities, applicant herein slightly amends the claims, and provides further clarification to the Examiner to overcome the Examiner's objections and rejections. Regarding the Examiner's merit rejections of applicant claims, applicant herein provides further argument to more particularly point out the patentable subject matter of applicant invention, and to clearly and unarguably

establish that the limitations of the claims are not anticipated or suggested in prior art presented, either singly or in combination.

Regarding the Examiner's objection to claim 24, applicant has herein amended the claim to correct the typographical error. Regarding the Examiner's rejection of claims 10 and 21 under 35 U.S.C. 112, first paragraph, and the rejection of claims 1-21, 23-24, 26-27 and 29-32 under 35 U.S.C. 112, second paragraph, applicant herein provides further clarification to the Examiner to aid in understanding and interpreting the specific key and patentable limitations of applicant claims.

The Examiner has stated that, regarding claims 10 and 21, the Examiner does not understand applicant's claim language of " ingress path...for receiving data packets" and "data packets...output to the ingress path". The Examiner does not understand how the egress and ingress paths interchange their functions. Applicant provides below further clarification to the Examiner to aid in interpretation of the characterization of the limitations of applicant claims. Applicant wishes to clarify to the Examiner to true meaning of the characterization in question, by directing the Examiner's attention firstly to applicant's Fig. 4, and the accompanying description of the embodiment presented in applicant's specification.

Applicant's base claims 1, 10 and 21 recite that arriving data packets assigned for multicasting are delivered to the multicast engine wherein they are replicated and/or readdressed, or modified as needed, and are then output to the ingress path into the port. Referring now to applicant's Fig. 4, fabric card 321 comprises a plurality of ports, all of which are enabled for both ingress and egress, as is clearly illustrated. In a preferred embodiment, one or more of the ports are enabled for multicasting, by virtue of a multicast engine integrated as part of the port, thereby providing a multicast capable port (M-port 325). M-port 325 is but one of a plurality of such multicast capable ports in the embodiment presented, and is further detailed in applicant's Fig. 5.

Referring now to applicant's Fig. 5, data packets assigned for multicasting arrive at multicast port 325 for replication and/or readdressing or modification as needed, from crossbar switching facility 327 following the egress path through multicast port 325 ("arrive at the port on the egress path"). Those data packets assigned for multicasting are diverted from the egress path to multicast engine 339 via exemplary line 341, wherein they are replicated and/or readdressed by the multicast circuitry (multicast engine 339) within multicast port 325. Once multicast engine 339 completes the replication and address assignment, the replicated/readdressed data packets are transmitted (output) via exemplary line 343 to the ingress path of multicast 325 as incoming data packets ("output to the ingress path into the port"), wherein the data packets ultimately enter Crossbar Switching Facility 327 (Fig. 4) for distribution over various paths according to the assigned addresses for the replicated data packets.

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To paraphrase for the Examiner, the multicast engine therefore receives (input) multicast data packets for replication/readdressing from the egress path from the crossbar switching facility, and transmits (output) the replicated/readdressed multicast data packets to the ingress path through multicast port 325, and ultimately to the crossbar switching facility along the ingress path. The egress path from which data packets are input to multicast port 325 is the egress from the crossbar switching facility, and the ingress path to which the replicated/readdressed packets are then output from the multicast engine is the ingress to the crossbar switching facility.

Further regarding the Examiner's 112 rejection of applicant claims, the Examiner stated that, regarding claims 10 and 21, it is not clear to the Examiner which port is referred to (line 10, claim 10; line 9, claim 21). In response, applicant herein amends claims 10 and 21 to recite at least one multicast engine coupled to at least one of the ports, forming at least one multicast-capable port, and the data packets are output to the ingress path into the multicast port, and the multicast engine is integrated as a part of the multicast-capable port.

The Examiner has further stated that, regarding claims 1, 10, 16, 21, 24 and 27, it is not clear to the Examiner which port at the multicast engine/component is used for receiving and transmitting data packets. Applicant wishes to clarify to the Examiner that all or any of the ports are capable of both receiving (input) and transmitting (output) data packets. Referring the Examiner again to applicant's Fig. 4, all port 323 are capable of both ingress and egress, and multicast port 325 is enhanced with multicast capability. Applicant has herein amended claims 10 and 21 in response to the Examiner's above 112 rejection of applicant claims to clarify the multicast port and output of data packets to the ingress path of the multicast port. Claims 1, 16 and 27 in their present form specifically recite multicast ports both in the preamble and/or body and characterization clause of the claims, thereby specifically reciting which port is used for receiving and transmitting the multicast data packets.

The Examiner has rejected claims 15-20 as being anticipated by Takahashi. The Examiner has stated that, regarding claim 15, Takahashi discloses applicant's multicast engine comprising all of the limitations of applicant's claim. In response, applicant herein cancels claim 15, and provides detailed argument below, which will clearly distinguish applicant's claim 16 over Takahashi.

Regarding claim 16, the Examiner has stated that Takahashi also discloses all of the specific limitations of applicant's claim. Applicant respectfully traverses the Examiner's statement, and points out to the Examiner that Takahashi clearly does not anticipate all of the specific limitations. Firstly, applicant points out to the Examiner that the Examiner's equation between crossbar switch 80 in Takahashi and applicant's multicast capable data router is improper. Takahashi shows in Fig. 1 a system 10 having a port authorization module 82, however, the multicast capable component (multicast module 110) is completely separate from crossbar 80. Takahashi has no capability of accepting, at input or output, multicast packets and replicating them, as is specifically taught and claimed in applicant invention.

Although Takahashi does teach a replication processor 112, the implementation of the replication in Takahashi's system 10 is certainly distinct from that taught and claimed in applicant's invention. It is the implementation of the multicast capability of the multicast capable port itself, which is a key and patentable aspect of applicant's invention. For multicast packets arriving at the multicast port of the fabric card of the data router, that particular port can process all of the multicast packets, and then transmit (output) them back out through that same port.

Referring again now to applicant's Figs. 4 and 5, Fig. 4 shows a fabric card having a multicast port 325. Figure 5 shows a multicast engine 339 within the multicast port 325, integrated as part of multicast port 325. In contrast, Takahashi shows in Fig. 1, a system 10 having a crossbar 80 having a port authorization module 82, and a replication module 110 which is separate from crossbar 80, therefore, applicant argues that the Examiner's equation of crossbar 80 a Takahashi to applicant's claimed multicast capable router of claim 16 is improper, and the Examiner's statement that crossbar 80 has a multicast capable port 110, is inaccurate. Applicant respectfully points out to the Examiner that multicast replication module 110 is not a port at all, and therefore cannot be equated as a multicast port because multicast replication module 110 of Takahashi and applicant's multicast capable port are two distinctly different elements.

The Examiner has further stated that port 110 a Takahashi has at least one ingress path 109 into the port for receiving the data packets, and at least one egress path 121 out of the port for outputting data packets. Applicant points out to the Examiner, however, that applicant's ingress path is a path through the port (refer to applicant's Fig. 5), not simply to the port, as in Takahashi, and applicant's egress path is also a path through the port, not simply leading from the port, as in Takahashi.

Takahashi clearly does not teach or suggest a multicast capable port, as is specifically taught and claimed in applicant's invention, and therefore clearly fails as a primary reference for a prima facie rejection of applicant's claim 16. Claim

16 is then patentable over Takahashi, and claims 17-20, as dependent from claim 16, are patentable on their own merits or at least as depended from a patentable claim.

Claims 10, 12-14, 21, 23-24 and 26 have been rejected by the Examiner as being unpatentable over Harriman in view of Takahashi. The Examiner has stated that, regarding claim 10, Harriman discloses substantially the limitations of applicant's claim, with the exception that Harriman does not explicitly disclose that the multicast engine is integrated as a part of the port of the fabric card in the router, relying on the reference of Takahashi for teaching the deficiency, stating that Takahashi discloses that the multicast engine 112 is integrated as a part of a port of a line/fabric card 110 in router 10, and therefore would have been obvious to combine.

In response, applicant respectfully traverses the Examiner statement, and points out to the Examiner that applicant's claim 10 as amended specifically recites a multicast capable fabric card within a data router comprising at least two ports, and comprising at least one multicast engine, characterized in that the multicast engine is integrated as a part of the multicast port of the fabric card in the router. In contrast, Harriman shows in Fig. 1, a fabric card 110, and input ports 102 and output port 104, which are clearly outside and separate from fabric card 110 as is clearly shown in the illustration. The Examiner's statement that Harriman discloses a fabric card 110 comprising at least two ports (102 and 104) is inaccurate. Fabric card 110 of Harriman is coupled to, not comprises, at least two ports. As discussed earlier, the key and novel aspect of applicant's invention as taught and claimed is having the multicast capability integrated as part of the port itself, not simply coupled to the port. This is clearly not the case in Harriman. Further, as also discussed above, Takahashi does not teach a multicast capable port, and therefore clearly does not teach or suggest that the multicast capability is integrated as a part of the port, so the Examiner's reliance on Takahashi for teaching for suggesting this specific limitations is also improper.

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Applicant argues that the specific teaching of applicant's invention that multicasting is performed within a multicast capable port, and a multicast capable circuitry is integrated as part of the multicast port, is a key and advantageous aspect over the prior art. Applicant's invention thereby provides multicast capability within the data router having multiple router cards such that multicasting activity may be appropriated to multiple multicast components within the router, thereby not taxing any one component or path of the router, and is also thereby scalable for large numbers of router ports and heavy multicast traffic and could similarly be appropriated to a plurality of cooperating routers in a given network eliminating a prior-art requirement for use of powerful multicast servers for large assignments.

Applicant's multicast port is an added ingress/egress port enhanced with multicasting capability. The intrinsic design of applicant's multicast fabric card leaves provision for installing more than one multicast capable port on each card, and in addition, one or more multicast ports on any one fabric card can be activated or deactivated according to projected need. Therefore, on a fabric card with multiple multicast ports, one, or a plurality of multicast ports may be activated for service depending on projected load and needs of the multicast system. When projected volume of a particular multicast assignment demands, some or all of the multicast enhanced ports on fabric cards within a router may be activated for the duration of the increased load. Further, in one embodiment of applicant's invention, all packets could be routed off the multicast fabric card using a single or several ports, and addressing manipulation capability can be performed at any input port on any router card by port manipulation of packet headers.

As argued above by applicant, base claims 10, 21, and 24 are then clearly patentable over the prior art cited and applied by the Examiner. Claims 12-14, 23 and 26 are then patentable on their own merits or at least as depended from a patentable claim.

The Examiner has rejected applicant's claims 1-8 as being unpatentable over Holden over Takahashi, stating that, regarding claim 1, Holden discloses applicant's fabric card having multiple ports, and one or more multicast capable ports comprising substantially the limitations of applicant's claim, with the exception that Holden does not explicitly disclose the multicast capable component, again relying on Takahashi for disclosing this deficiency. Applicant's claim specifically recites one or more multicast capable ports for replicating multicast data packets. As admitted by the Examiner, Holden does not disclose a multicast capable component, and as substantially argued above by applicant, Takahashi clearly and unarguably does not teach, suggest or intimate a multicast capable port; rather, Takahashi teaches a replication processor, and the implementation of the replication in the system of Takahashi is clearly distinct from that taught and claimed in applicant's invention. Applicant reiterates that it is the implementation of the multicast capability of the multicast capable port itself, which is a key and patentable aspect of applicant's invention. For multicast packets arriving at the multicast port of the fabric card of the data router, that particular port can process all of the multicast packets, and then transmit (output) them back out through that same port. This is clearly not the case in any of the teachings of Takahashi.

Applicant therefore strongly believes that claim 1 is then clearly patentable over the combination of Holden/Takahashi. Claims 2-8 are then patentable on their own merits, or at least as depended from a patentable claim.

The Examiner has rejected claim 11 as being unpatentable over Harriman over Chao, and has rejected claim 32 as unpatentable over Harriman over Takahashi and further in view of Teraslinna, and has rejected claim 9 as unpatentable over Holden over Takahashi and further in view of Harriman. The claims, however, all depend from base claims, which have been clearly demonstrated as argued above and slightly amended by applicant, to be patentable over any of the prior art references presented by the Examiner. The claims are




then patentable on their own merits or at least as depended from a patentable claim.

Applicant notes that the Examiner has not specifically rejected the merits of applicant's base claim 27 in the instant Office Action, but provides statements on page 12 regarding claims 27, 29 and 31. Claim 27 is applicant's method claim for multicasting according to applicant's system and apparatus claims, which have been clearly shown to be patentable over the prior art references cited and applied by the Examiner. Claimed 27 specifically recites wherein the multicast engine is integrated as a part of a port of a line card in the router, which, as substantially argued above by applicant, is not specifically disclosed, suggested or intimated by any of the prior art references, either singly or combined. Claimed 27 is then patentable as argued above on behalf of the apparatus and system base claims, claims 29-31 are then patentable on their own merits, or at least as depended from a patentable claim.

As all of the claims have been clearly shown as amended and argued above to be patentable over the prior art presented, applicant respectfully requests that applicant's above claims be reconsidered, the rejections are withdrawn and that the case be passed quickly to issue. If any fees are due beyond fees paid with this amendment, authorization is made to deduct those fees from deposit account 50-0534. If any time extension is needed beyond any extension requested with this amendment, such extension is hereby requested.

Respectfully Submitted,  
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